DEC STD 140-4 Etch Board and Module Release Verification Requirements and Procedures—Data Requirements

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ABSTRACT: This section of DEC STD 140 describes the engineering and manufacturing product data (information) requirements for fabrication of prototypes and for volume manufacturing. Refer to DEC STD 140-0 Documentation, Data, and Release Requirements for Printed-Wiring Boards, Modules, and Backplanes — Introduction for additional information.

APPLICABILITY: Use of this document is mandatory for the manufacture of all 50-class boards, 54-class modules, and 70-class backplanes released by Digital.

STATUS: APPROVED 27-Sep-1991; use VTX SMC for current status.

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1 INTRODUCTION

This section of DEC STD 140 defines the product data required to support prototype production and volume manufacturing of printed-wiring boards (PWBs), assembled modules, and backplanes. Production includes the abilities to fabricate, assemble, and test the product being described.

2 DEFINITIONS

The following subheads contain definitions of the types of data referred to in this document.

2.1 PRODUCT DATA VERSUS PROCESS DATA

For the purposes of this standard, *product data* is defined as the collection of information that exists to represent the finished physical product, and not the processes that are used to create that product.

Process data may change any time a plant upgrades or modifies its process. Additionally, process data will frequently vary from plant to plant. Since process data is in fact plant tool-specific, no attempt will be made in this document to specify what process data is required. It is viewed as the manufacturing plant's responsibility to either generate or have generated for them the process data required.

2.2 DATA ELEMENTS

For the purposes of this standard, *data elements* are defined as any individual piece of product information required for the fabrication, assembly, or test within the PWB, module, and backplane manufacturing environments. Information regarding schedules, cost, cycle time, and so on, is not included in these definitions because it is considered business data and not manufacturing product data.

Also for purposes of this standard, data elements have been subdivided into two categories: *build* and *reference*. The following headings contain definitions of these categories.

2.2.1 Build Data Element

A build data element is defined as a unique physical characteristic or property of the product that exists to drive manufacturing software systems or process equipment. Although build data elements are always stored on computer media, neither the format nor the delivery procedures for the specified build data elements are the subject of this standard. However, all build data elements described in this standard must be made available in an acceptable format and at an appropriate time.

2.2.2 Reference Data Element

In today's manufacturing processes, reference data elements may be stored on paper, computer media, or in many cases, on both. Neither the media nor the delivery vehicle of the reference data requirements is the subject of this section. The reference data described in this standard must be made available in an acceptable format.

2.3 PWB PRODUCT DATA

This category of data refers specifically to all the data used to define the PWBs as designed by engineering and fabricated and tested in manufacturing. PWBs typically carry an inventory class code of *50-*, therefore, this category of information is generally referred to as *50-level* data.

2.4 MODULE PRODUCT DATA

Module data refers specifically to all the data used to define the completed module as designed by engineering and assembled and tested in manufacturing. Not all modules carry an inventory class code of *54-*; however, the term *54-class* (or *54-level*) is used generically to describe this type of assembly.

2.5 BACKPLANE PRODUCT DATA

Backplane data refers uniquely to the data that defines the assembled and tested backplane. Like 50- and 54-class data, not all backplanes carry an inventory class code of *70-*; however, the term *70-class* is often used to generically describe any type of backplane assembly but it is not limited to backplanes. Backplanes may also appear as partial or completed module assemblies.

2.6 MANUFACTURING DATA VERSUS ENGINEERING DATA

Engineering data is considered to be the collection of all the data that represents the product as designed through the engineering design process. Engineering data must represent the product as it will appear in its final physical form. For PWB data, this is often referred to as *circuit level* information reflecting only a single completed circuit board. For 54-class, data is represented for a single module assembly.

Manufacturing data is all the information that presents a physical description of the product as it appears at specific stages in the manufacturing process. For PWB data, this is often referred to as (assembly) *board level* data. In manufacturing, an assembly board may contain multiple *circuits* of the same design. Manufacturing data exists to allow manufacturing the flexibility to fabricate and assemble products in a cost-effective manner.

3 RESPONSIBILITIES

The following subheads contain the responsibilities for each function.

3.1 Engineering Design Site

Ultimately it is the responsibility of the engineering design site to provide to manufacturing all applicable data elements and reference data as negotiated with each manufacturing site.

3.2 Manufacturing Producibility

The site Producibility group is responsible to ensure that products can be manufactured in volume in the most cost-effective manner. Site Producibility:

- Verifies the manufacturability of the design features with the applicable standards.
- Ensures the manufacturing checks and tools have been run and any identified problems negotiated.

4 PWB MANUFACTURING DATA REQUIREMENTS

The specific data requirements will be negotiated by Manufacturing and Engineering on a program-by-program basis. These requirements should be specified on one or more ELMF-class documents. Data supplied by Engineering should include, at a minimum, data to support the following manufacturing processes.

- Photoplotting or imaging
- Drill
- Electrical bare-board test
- Documentation (See *DEC STD 140-1 Documentation Requirements for Printed-Wiring Boards (50-Class)*, Table 1.

5 MODULE MANUFACTURING DATA REQUIREMENTS

The specific data requirements will be negotiated by Manufacturing and Engineering on a program-by-program basis. These requirements should be specified on one or more ELMF-class documents. Data supplied by Engineering should include, at a minimum, data to support the following manufacturing processes.

- Documentation (See *DEC STD 140-2 Documentation Requirements for 54-Class Modules and Backplanes*, Table 1.
- Functional test
- Parts list
- Solder paste stencil data

6 BACKPLANE MANUFACTURING DATA REQUIREMENTS

The specific data requirements will be negotiated by Manufacturing and Engineering on a program-by-program basis. These requirements should be specified on one or more ELMF-class documents. Data supplied by Engineering should include, at a minimum, data to support the following manufacturing processes.

- Documentation (See *DEC STD 140-3 Documentation Requirements for Backplanes (54- and 70-Class)*, Table 1.
- Electrical bare-board test
- Functional test data
- Parts list
- Component placement data (including fiducial information)

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00140-00	*DEC STD 140-0 Documentation, Data, and Release Requirements for Printed-Wiring Boards, Modules, and Backplanes — Introduction*
EL-00140-01	*DEC STD 140-1 Documentation Requirements for Printed-Wiring Boards (50-Class)*
EL-00140-02	*DEC STD 140-2 Documentation Requirements for 54-Class Modules and Backplanes*
EL-00140-03	*DEC STD 140-3 Documentation Requirements for Backplanes (54- and 70-Class)*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

APPENDIX B RELATED DOCUMENTS

B.1 Other Digital Documents

Document Number	Document Title
EL-ENMDB-00	*Manufacturing Data Base Files Specification*
EL-MF591-00	*Printed-Wiring Board Resistor Test File Specification*
EL-MF721-00	*Printed-Wiring Board Continuity Test File Specification*
EL-MF759-00	*Manufacturing Data Elements Reference Document*

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